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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/995,433	11/27/2001	Donald Ray Bloyer	1834.135US1	9787

7590 09/15/2003

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EXAMINER

MILLER, PATRICK L

ART UNIT	PAPER NUMBER
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2837

DATE MAILED: 09/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/995,433

Applicant(s)

BLOYER ET AL.

Examiner

Patrick Miller

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,7-24 and 28-30 is/are rejected.
- 7) ☒ Claim(s) 4,6 and 25-27 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11/27/01 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 4-6, 11, 14, and 28-30 are objected to because of the following informalities:

See bullets below. Appropriate correction is required.

- Claim 4 discloses the step “(b)(i)(1).” This step is already cited in claim 3.
Please clarify.
- Claims 5 and 6 cite, “a head and a disc” (twice each). These limitations are previously cited in claim 1. Change “a” to “the.”
- Claim 11 cites, “an occurrence” and “a head and a disc.” Previously cited in claim 1. Change “an” and “a” to “the.”
- Claim 14 cites, “the air-bearing stability.” Lack of antecedent basis for this term.
Air-bearing stability is initially cited in claim 13, not claim 12.
- Claim 28 cites, “spindle motor at a each of a” (page 33, line 14). Please correct.
- Claim 29 cites, “a mass storage device of a mass storage device.” Delete one occurrence.
- Claim 30 cites, “an interface between the head.” “An interface” is previously cited in claim 29. Change “an” to “the.”

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2, 16, 23, 24, and 29 are rejected under 35 U.S.C. 102(e) as being anticipated by Li (6,401,214).
 - With respect to claims 1, 2, and 16, Li discloses a method for controlling a motor, the method comprising the steps of: directing current to the motor of a spindle of a mass storage device (fig. 1), modulating the current in reference to a predetermined profile (col. 5, lines 29-44), and modulating the current in reference to an interference between a head and a mass storage device disc (col. 8, lines 19-26).
 - With respect to claims 23 and 29, Li discloses an information handling system to control a spindle motor of a mass storage device comprising: a rotatable recording medium (fig. 2, #212), a spindle motor (fig. 2, #218), a processor (fig. 2, #229), a head (fig. 2, #221), a means for the processor to modulate the current to the spindle motor to reduce interference at the interface between the head and the rotatable medium (col. 8, lines 19-26).

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- With respect to claim 24, Li discloses a predetermined profile that modulates the current in reference to a predetermined profile at a plurality of times (col. 5, lines 29-44),
3. Claims 12 and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Oida (6,429,997).
- Oida discloses a method for generating a profile of modulated current of a spindle motor of a mass storage device, the method comprising: receiving performance data of the mass storage device, the data including spindle motor current and at least one performance measurement (fig. 2, receives position and speed info.), determining a portion of the performance data that indicates inadequacy and exceeds a predetermined threshold (col. 8, lines 52-63), and generating a profile in reference to the performance inadequacy (col. 8, lines 63-65).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li (6,401,214) as applied to claims 1 and 2 above, and further in view of Veale (4,491,776).
- Li does not disclose modulating the current based on a predetermined non-linear profile.

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- Veale discloses modulating the current to in reference to a predetermined non-linear profile. The motivation is to provide a predetermined velocity relative to a position of the moveable member. This provides the advantage of using less space in memory for a non-linear profile as opposed to a completely linear profile.
 - Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention that the profile of Li could be implemented as a non-linear profile, thereby providing the advantage of using less memory, as taught by Veale.
5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li (6,401,214) as applied to claim 1 above, and further in view of Nakano et al (5,970,003).
- Li discloses modulating the current in response to an occurrence of interference between the head and a disc of the mass storage device where the interference has exceeded a predetermined threshold (col. 8, lines 5-26).
 - Li does not disclose predicting an occurrence of interference.
 - Nakano et al disclose predicting a disturbance. The motivation to predict disturbances is to produce a compensation force equivalent to the disturbance. This provides the advantage of canceling out the disturbance (cols. 12/13, lines 60-67/1-9).
6. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li as applied to claim 1 above, and further in view of Smith (6,574,754).
- Li does not disclose modulating the current in reference to a predetermined profile, where the profile reduces air-bearing instability and takeoff air-bearing instability.

- Smith discloses modulating the current from a profile, where the profile reduces takeoff air-bearing instability (from beginning of a seek operation). The motivation to compensate for air-bearing instability is detect resonance between the head and disc. This provides the advantage of allowing the system to attenuate certain resonant frequencies that degrade system performance (col. 9, lines 25-41).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the apparatus of Li so the apparatus reduces the takeoff air-bearing instability, thereby providing the advantage improved system performance, as taught by Smith.

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li as applied to claim 1 above, and further in view of Galvin et al (5,530,326).

- Li does not disclose modulating the current during spin-up.
- Galvin et al disclose controlling a servomotor (modulating current) during a spin-up sequence. The motivation to do such is to provide a digital low pass filter function to the controller. This provides the advantage of “blanking” the noise or anomalies (cols. 9/10, lines 60-67/1-12).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention that the apparatus of Li could modulate current during spin-up, thereby providing the advantage of “blanking” the noise or anomalies that occur during spin-up, as taught by Galvin et al.

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8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li as applied to claim 1 above, and further in view of Ogino (5,768,226).

- Li does not disclose modulating the current during spin-down.
- Ogino discloses disturbances that occur when the motor stops (spin-down), and attenuating the disturbances (modulating the current). Ogino also discloses attenuating these disturbances that occur when the motor stops. This provides the advantage correcting the seek function on the basis of a more accurate velocity (col. 2, lines 42-67 and col. 6, lines 1-17).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention that apparatus of Li could modulate the current during spin-down, thereby providing the advantage of correcting the seek function, as taught by Ogino.

9. Claims 11 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li as applied to claims 1 and 29 above, and further in view of Okada et al (6,249,495).

- Li does not disclose a means for increasing current when a disturbance between the head and disc occurs.
- Okada et al disclose a means for increasing the current in reference to a large disturbance. The motivation to increase the current is to send a signal to the rest state of the controller. This provides the advantage of stopping head at the current position until the disturbance has sufficiently subsided (col. 23, lines 39-67).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention that apparatus of Li could be modified to increase current

when a disturbance is detected, thereby providing the advantage of stopping the head until the disturbance has stopped, as taught by Okada et al.

10. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oida (6,429,997) as applied to claim 12 above, and further in view of Smith (6,574,754).

- Oida does not disclose modulating the current in reference to a predetermined profile, where the profile reduces air-bearing instability and takeoff air-bearing instability.
- Smith discloses modulating the current from a profile, where the profile reduces takeoff air-bearing instability (from beginning of a seek operation). The motivation to compensate for air-bearing instability is detect resonance between the head and disc. This provides the advantage of allowing the system to attenuate certain resonant frequencies that degrade system performance (col. 9, lines 25-41).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the apparatus of Oida so the apparatus reduces the takeoff air-bearing instability, thereby providing the advantage improved system performance, as taught by Smith.

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oida as applied to claim 12 above, and further in view of Dunn et al (5,473,230).

- Oida discloses storing a profile in memory (burning), but does not disclose measuring the drag and speed for performance data.

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- Dunn et al disclose an apparatus that detects drag and speed of a spindle motor for a disc drive. The motivation to measure the speed and drag is to produce a velocity error that is put into a compensation control loop. This provides the advantage of reducing the disturbance's effect on the apparatus (col. 4, lines 1-27).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the apparatus of Oida as described above, thereby providing the advantage of reducing the disturbance's effect on the apparatus, as taught by Dunn et al.

12. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li as applied to claim 16 above, and further in view of Oida (6,429,997).

- Li does not disclose measuring the speed of the disc, comparing the speed to a look up table, and interference is indicated if the speed does not meet the predetermined value.
- Oida discloses measuring the speed of the disc (via an integrator) (fig. 3, output of 29b; col. 4, lines 3-5), comparing the speed to a speed profile (look up table) (fig. 4, ST5), and determining that interference has occurred if the two speeds do not match-up (ST6). Oida's motivation for doing such is so computation is eliminated. This provides the advantage of simplifying the setting of the speed profile (col. 4, lines 42-47).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention that apparatus of Li could be modified as described above,

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thereby providing the advantage of simplifying the setting of the speed profile, as taught by Oida.

13. Claims 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li as applied to claim 16 above, and further in view of Yamashita et al (6,157,599).

- Li does not disclose measuring the time per revolution and comparing the time per revolution to an expected time, and if different indicates an interference. Li also does not disclose sampling the acceleration, comparing the acceleration to a last sample, sampling the acceleration at each revolution, at multiple revolutions, and at sub-multiple revolutions.
- Yamashita et al disclose measuring latch timing (time per revolution) and comparing it to an expected latch timing. Yamashita et al also disclose sampling acceleration, comparing the acceleration to a last sample, and the sampling is variable, which means the sampling could be set to any of the above conditions. The motivation to determine the sample the acceleration as described is to determine a zero-cross error has occurred. This provides the advantage of calculating a prediction speed (cols. 19/20, lines 60-67/1-62).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention that apparatus of Li could be modified as described above, thereby providing the advantage of calculating a prediction speed, as taught by Yamashita et al.

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Allowable Subject Matter

14. Claims 4, 6, and 25-27 are objected to as being dependent upon a rejected base claim, but would be allowable if the minor informalities are corrected and rewritten in independent form including all of the limitations of the base claim and any intervening claims.

- With respect to claims 4, 6, and 25, the Prior Art does not disclose controlling a spindle motor by monitoring a lapse of time, wherein the lapse of time represents the amount of current to modulate the motor when an interface between the head and disc occurs.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick Miller whose telephone number is 703-308-4931. The examiner can normally be reached on M-F, 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Nappi can be reached on 703-308-3370. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-3431.

Patrick Miller
Examiner
Art Unit 2837

pm
September 7, 2003


ROBERT NAPPI
SUPERVISORY PATENT EXAMINER